Missouri Public Service Commission

Staff Report on Restoration Efforts Following Major Ice Storm in Late January of 2002

Issued: June 14, 2002

Table of Contents

Missouri Public Service Commission Staff Investigation

Ice Storm of January 2002

Introduction

This report is a result of the investigation of the Staff of the Missouri Public Service Commission (Staff) into the responses of the regulated electric utilities in Missouri to an ice storm that started on Wednesday, January 30, 2002. This ice storm struck portions of western and northern Missouri leaving devastation and darkened homes and businesses. Many news articles referred to this ice storm as the worst in Missouri's history. It is interesting to note that this happened only a little over five years after the last "worst" outage incident in history, an early snow storm that occurred in October of 1996 in the Kansas City area.

During this storm ice accumulated on any object that was at or below freezing and the weight of the ice broke utility poles, conductors, tree limbs and any other thing that could not withstand the weight of the ice. Ice accumulations of well over an inch were reported in many areas. Many tree branches could not withstand the added weight of the ice and fell to the ground, striking whatever was in their path. Cars, homes, streets, property and electric power facilities were recipients of the falling trees and limbs. Ice continued to accumulate and the melting, falling ice caused additional outages. Some electric customers experienced outages more than once during that period as power was restored but was interrupted again by falling limbs. At the peak of the outages, over 400,000 customers were without power. Within three days most of these customers were returned to service but many customers in more heavily damaged areas were without power for over a week.

Electric utilities prepare for storms by developing a written plan to follow when abnormal events cause extensive outages to customers. This ice storm attracted the attention of electric utility operators in Missouri because the potential for icing was suggested by weather forecasters. Portions of Oklahoma, Kansas and Missouri were along the boundary between rain and snow that produced extensive ice accumulation. On the afternoon of January 30, 2002 the electric utilities in the Kansas City area and across central Missouri activated their restoration plans to restore electric service to their customers. This report will chronicle the responses to the ice storm by the electric utilities in Missouri that are regulated by the Missouri Public Service Commission. The regulated utilities affected by this ice storm include, Kansas City Power & Light Company, Missouri Public Service and AmerenUE. Many other electric customers of municipal systems and rural electric cooperatives suffered extensive outages as a result of this ice storm.

Overview

The utilities provided information daily to the Staff during the restoration. In addition, the Staff obtained data from the utilities compiled during and after the storm, much of which is presented in the attached Appendixes. Interviews were conducted with the personnel responsible for implementing the restoration plans at the company offices as part of review of their plans. Field inspections were conducted to observe the areas impacted by the ice and to discuss problems encountered by those who were supervisors in the field. Of particular interest were the tree-trimming schedules of electric circuits and it the trees were recently trimmed or if they were past the scheduled intervals. Staff also observed affected areas before the ice melted. Damage to trees and property is still evident today.

The Staff responded to more than 130 customer inquiries to the Missouri Public Service Commission during and after the storm. Concerns expressed included the difficulty in contacting the utility, incomplete information concerning restoration times, allocation of crews, power lines on the ground, service line/meter responsibilities and frustration of living in the dark for more than a week.

City governments in the affected areas were interviewed to learn of the interaction between the utilities and the entities that provide support to communities in the form of police, fire protection, emergency shelters and other local assistance. The Staff is not routinely involved with the city governments in regulatory electric matters, but the cities proved to be an important link in dealing with utility concerns. Utilities are concerned about poles and wires, but the cities have other resources and responsibilities in serving the public, especially during a crisis of this type.

An issue from the Snow Storm of October 1996 was the inability of customers to contact the utilities by telephone. With the magnitude of the ice storm and the number of customers affected it is not practical to have enough Call Center representatives available to respond to all customer calls. The automated systems now in operation allow customers to input information to the computer that generates work orders. Customers should allow the computer to capture this information by responding through the automated system. Recommendations in this report include encouraging the utilities to pursue ways to provide positive feedback to customers that their outage was recorded, to convey assurance that their outage report has been received.

Other conclusions from the Staff Snow Storm Report of 1996 encouraged sustaining the funding levels for tree trimming and training for storm preparedness. Expenses for trimming have grown since the 1996 storm for the utilities affected by the storm. Also, ongoing review of the existing emergency plans and training in anticipation of emergencies was evident in the Staff review.

The responsibility of trimming trees along a service line to a home is often an area of concern and misunderstanding. Electric utilities trim trees where they have a dedicated easement that allows access for maintenance. These easements include the recorded utility easements and public right-of-way. Service lines to the home cross private property without a specific easement and utilities do not trim these trees. Electric utilities will disconnect the service lines to allow property owners or contractors to safely trim service lines.

The primary conductors (typically 7,200 volts) of the distribution system are not insulated and contact with tree limbs can cause arcing or electrical short circuits to ground. This contact may cause quality of service problems for sensitive electrical equipment. Service lines (typically 240 volts) are insulated and can tolerate incidental tree contact. Appendix C has further information on service line responsibilities. Missouri Public Service repaired and replaced meter bases that other utilities did not, which contributed to a level of confusion regarding customer/utility responsibilities in the Kansas City area, plus added to the restoration time in the MPS service areas.

The impact of the ice storm sometimes caused trees off the right-of-way to fall through the electric lines. Even if properly trimmed, trees caused extensive damage to the electric facilities in these circumstances. Removal of over-hanging limbs improves the situation. Transmission lines are trimmed to the edge of the right-of-way to protect the line from falling trees, but these lines have easements of one hundred (100) to one hundred fifty (150) feet wide. Transmission lines provide service to many customers and are protected by a much higher standard to ensure reliability.

The utilities affected by the ice storm in Missouri quickly mobilized all of their available crews and sought outside assistance. Out-of-state crews arrived Friday and Saturday and provided the extra workforce to repair the electric distribution system. The Restoration Plans provided the organization and structure needed to manage a workforce five to ten times larger than normal.

Customers trying to call their utility to report outages were frustrated by lack of answers to questions about when power would be restored, downed service lines in their yards and a lack of understanding of the responsibilities for meter bases and connections at the home. Frustrations grew as three, four, and five days without electric service stretched to over a week for some customers, with consequences of lost property, business, and fading confidence that utilities responded properly.

From an overview perspective, the Staff finds that the utilities did respond in accordance with their emergency plans. Could there be improvements, certainly. Electric customers could recognize problems brought by the accumulated ice, but desired more information on where work was focused and when to expect restoration of power. Communication through the utility Call Centers was difficult because of the sheer volume. The customers desired

feedback and affirmation their outage was recorded and when to expect service. Many found the websites to be a good source for information and Staff expects that this media will be used more in future outage situations.

Computer access is not available to homes without electric service but many customers still found ways to access websites. Other media is very important to provide information to customers. Utilities that were busy fixing the damage from the ice found that projecting restoration dates was very difficult and tried to avoid instilling false hope. City officials were frustrated by data that was grouped with other cities and did not help them deal with the local crisis.

The availability of supplies to repair facilities to restore electric service was stretched to the limit, but did not slow the restoration. Transmission line outages did occur, but did not impact the overall restoration effort. The ice accumulation, although heavy on trees and electric facilities, did not accumulate on the streets to impair the restoration effort.

The impact of the ice storm on the AmerenUE service territory was less severe than the Kansas City metropolitan area. The AmerenUE Excelsior Springs District was on the northern edge of the ice accumulation. Portions of central Missouri in and around Moberly, served by AmerenUE, and to the northeast corner of the state sustained heavy damage. Missouri Public Service customers outside of the Kansas City area, from south of Kansas City to Warrensburg, also sustained heavy damage.

Summary of Staff recommendations:

1. Maintain schedules for tree-trimming cycles to ensure safe and reliable service.

2. Contact city officials and agencies impacted by extended electric outages twice a year to update telephone and personnel changes.

3. Ensure medical-need customers understand procedures and expectations of program.

4. Provide feedback to automated telephone system users that the information has been received.

The Staff will review the recommendations with each of the electric utilities affected by this ice storm within six months. Staff will participate in meetings with city officials and utilities to underscore this important communication link. Call Center operation and outage analysis will be monitored by the Staff to evaluate any changes implemented.

Kansas City Power & Light Company

Restoration Plan

The Storm Evaluation & Restoration Plan (SERP) provides operating procedures enabling a rapid and efficient restoration of service for any storm damage emergency. The SERP has been developed to provide Kansas City Power and Light Company (KCPL) with a trained, operational work force to respond to storm damage. The objective of the SERP is to be prepared to direct large quantities of manpower and equipment to the restoration effort.

On Tuesday, January 29, 2002, KCPL was anticipating the incoming storm and notice was provided to personnel to be prepared for storm assignments. As ice continued to build up on Wednesday, the SERP was activated at around 4:00 PM and staging areas were organized to accommodate crews from other utilities. Contract electrical crews and tree-trimming crews were also sought to assist with the restoration. By Thursday, January 31st, approximately 305,000 of KCPL's 474,000 total customers had experienced interruptions. This storm was classified as a Class IV, the most severe, in the SERP. Appendix D-1 summarizes the customer outages by day for the duration of the storm. The majority of the damage from the ice storm for KCPL was in the metropolitan Kansas City area, both Missouri and Kansas and in the KCPL South District in Kansas. The KCPL East District, covering portions of six counties in west-central Missouri, also sustained ice damage.

In response to the ice storm, KCPL also activated their Wire Down Teams to evaluate and de-energize wires that posed an immediate threat to public safety. These special teams provide resources that are dispatched in response to calls from police, fire, city officials and the public, and allow the normal KCPL crews to concentrate on restoration of service to critical facilities and KCPL's other electric customers.

Critical public service facilities such as hospitals, city halls, county court houses, fire, water and police stations are restored first. Efforts then focus on restoring service to the maximum number of customers in the minimum amount of time. No workmen were injured from contact with electric lines during the restoration, but injuries were sustained in a burn incident involving a member of the public.

Re-energizing major circuits from distribution substations is a primary effort since this restores service to large blocks of customers quickly. This is illustrated in Appendix D-1 by the rapid decline in customer outages as the circuits locked out were restored. After the major circuits are energized, smaller groups of customers or neighborhoods are restored. See Appendix B for a pictorial representation or www.kcpl.com/storm/StormRestore for the KCPL explanation.

Restoration Workforce

Appendix D-2 is a summary of the workforce assembled to restore service in the KCPL service area. The crews from other utilities began arriving on Friday, February 1st. Eventually, eleven (11) utilities and ten (10) contractors from sixteen states were utilized in the restoration effort. Approximately six hundred (600) employees of KCPL from all areas of the company were activated to augment the SERP workforce. Others assisted with support activities including fleet maintenance, purchasing, and communications.

Ameren crews were released to KCPL when restoration of AmerenUE customers was completed on Saturday, February 2nd. Missouri Gas Energy also provided employees to assist as guides for outside crews.

It was a monumental task to house and feed the extra crews working in the Kansas City area. In an effort to maximize workforce safety and productivity, an eight (8) hour rest period was scheduled daily. The process for coordinating the refueling of trucks and providing the necessary material for repairs was outlined in the SERP.

As outside crews arrived, they were assigned to work from specific substations due to the extensive damage sustained to many major circuits. This minimized travel to unfamiliar neighborhoods and delegated operational control to the supervisor at the particular substation. This de-centralized operation was directed to substations with the most damage. The crews completed restoration of all circuits in their assigned substation before being dispatched elsewhere.

After all the circuits were restored, many customers still had problems with service lines or meter bases. KCPL indicated that crews made minor repairs to items normally considered to be the customer's responsibility, such as a meter base and attachments on the house, while they were on-site. Some meters were bypassed by KCPL to allow restoration quickly; these installations were revisited to ensure that necessary customer work was completed and were ready for permanent repairs. KCPL meter personnel are conducting audits of the meters in the damaged area to identify any remaining damage. KCPL uses CellNet automatic meter reading and this audit is necessary to ensure that records were correctly updated if meters were changed.

Call Center

Customers can report outages two different ways. Twenty-First (21st) Century (1-888-LIGHTKC) is the primary outage reporting option, which allows customers to use the automated system to report trouble. By entering their premise phone number or account number, the trouble ticket is issued. If they are unable to report using this automated system, they can contact KCPL through the Call Center at 816-471-KCPL. The customer would not be able to utilize the automated system if they did not enter the correct promise phone

number listed on the account or if they did not have their account number available. KCPL's automated system mirrors that of 21st Century, but also offers customers a live representative option. KCPL's Call Center has 96 incoming lines and an additional 24 lines were activated for the SERP volunteers to assist in handling calls. After 120 lines are in use, the next customer attempting to call would receive a busy signal. The 21st Century system handled a majority of the calls on January 30th and 31st. Appendix D-3 contains Call Center statistics.

KCPL rebooted the Brite Interactive Voice Response (IVR) at the beginning of the storm to clear a problem. Due to the majority of calls being received by 21st Century, this did not negatively impact customers to a great extent. The phone service in the Kansas City area was not extensively interrupted during the ice storm, which was a benefit in coordinating the restoration.

Twenty-First Century has the capability to determine if a customer has called within the past 24 hours. When a customer calls twice within 24 hours, the system informs the customer that the outage has been recorded and that KCPL is aware that the customer is without service. Due to the length of this storm, KCPL found that the 24-hour status should have been increased to at least 48 hours. If the customer called a second time after 24 hours, the customer was not informed the system was aware of their outage and an additional service order was generated, which was repetitious.

The largest volumes of calls were received on January 30th and 31st and initially, the representatives were working 16-hour shifts. On the fourth day of the storm, February 2nd, the representatives' shifts were reduced to 10 hours. KCPL is of the opinion that this decision contributed to the representatives providing a higher level of customer service.

Some of the SERP volunteers had previously worked at the Call Center and had experience in handling calls. KCPL stated that sixty (60) additional SERP volunteers handled calls on January 30th and forty (40) SERP volunteers handled calls on January 31st. The SERP volunteers handled the "callbacks", which are calls made to customers to make certain their service has been restored or to obtain additional information regarding their outage. KCPL stated that the callbacks performed by the augmented SERP employees proved to be a very positive strategy. The information obtained was beneficial for KCPL in completing restoration and also for the customer by providing feedback that their problem was important and that KCPL was responding.

The Computer Aided Dispatch System (CADS) overloaded from the extreme volume of the incoming trouble tickets. A backup system was utilized to process trouble tickets. A project to enhance CADS is already underway and will be completed in 2002. The KCPL computer system groups trouble calls as they are received and summarizes the number of customer outages on each substation. This advises dispatchers of the highest concentration of outages. Call Center representatives are required to enter the service orders into the

computer system manually. This labor-intensive exercise caused some delays in processing orders.

Daily meetings were held with all responsible areas of KCPL dealing with the storm restoration efforts. Supervisors of the Call Center were provided storm restoration information during these meetings. Beginning February 1st through February 8th, two daily meetings were held Monday through Friday. One meeting per day was held on Saturday and Sunday. Information was then forwarded to the representatives.

All customers in the medical program are assigned a special identification number unique to that customer. KCPL found that many of these customers were unfamiliar with the program either due to not using the program or the time lapse since its last use. KCPL plans to provide updates to these customers with information to assist them in future outages.

Communication/Media

Despite the number of customers without electric service, a very effective communication tool during the ice storm was the KCPL website (www.KCPL.com). From January 30 to February 7, there were 347,003 visits to the site. During an average nine-day period, there are 42,200 visits to the website.

The Storm Restoration Page on the website was routinely updated after each SERP update meeting. Contents of the Storm Page included street boundaries of areas where line crews were working, safety messages, restoration statistics, utility and homeowner electric service responsibilities plus information about understanding power outages, priorities and the work needed for restoration. On February 5th a crew assignment map was added to the website. See an example of this map in Appendix D-4.

Restoration updates and information were provided in response to media inquiries to augment the daily updates provided on the website. Live and taped interviews were made to communicate the restoration effort in progress. KCPL contacted public and city officials to inform them of the impact of the ice storm and establish lines of communication. Kansas City, Missouri opened the Emergency Operations Center (EOC) to coordinate response to the emergencies brought by the damage of the ice. Despite early communication problems between the EOC and KCPL, KCPL representatives staffed the EOC during the restoration period providing input to the EOC and communicating with other city officials in the metro area.

Tree-Trimming

The devastation, caused by falling trees and limbs as a result of the storm, directs attention to the tree-trimming policies of the electric utilities. Tree limbs are trimmed along electric easements to the extent that limbs can be kept away from the electric lines until the next cycle commences. In urban areas, it is generally anticipated that trees would be trimmed on a three-year cycle, special attention being given to major three-phase circuits. In rural areas, the cycle is generally longer because more clearance is attained when trees are trimmed.

Expenditures on tree-trimming have increased over the last five years in the KCPL service area. In the Kansas City metro area there were circuits recently trimmed as well as some circuits past the normal cycle period. In many cases however, limbs and trees that are not the responsibility of the utility caused circuit outages and pulled down service lines to homes.

Review of the tree-trimming cycles in the Kansas City area and the number of outages reported on those circuits suggests that more customer outages occurred on the circuits with the longer periods since their last trimming. Intuitively, the closer the limbs, the more likely a weighted limb would cause damage. Circuits with extended growing cycles were more at risk. This observation suggests that efforts should be made to keep on needed trimming schedules for both regular service reliability and storm event damage.

Trees off the right-of-way and untrimmed service lines are additional perils that contributed to the overall damage. These areas are not the responsibility of the utility. Electric customers are more aware of the need to keep service lines trimmed because of the impact of the ice storm.

Conclusions

KCPL has a comprehensive restoration plan that outlines responsibilities and identifies individuals to implement restoration of electric service.

KCPL recognized the peril in the forecasts of an ice storm and organized in anticipation of the ice. KCPL was successful in getting commitment and mobilization of outside crews for tree-trimmers and electrical crews. Because of the travel time most of the crews arrived Friday or Saturday, February 1st and 2nd. Over the course of the restoration, KCPL had 2990 utility linemen, electrical contractors and tree-trimmers working to restore electric service.

KCPL de-centralized the work to substations where supervisors had operational control. The crews assigned to the substation were responsible for all the circuits from the substation and worked these circuits until all service was restored. Assignment of the work and crew safety was the supervisor's

responsibility at the substation. This approach was successful in keeping the crews productive and relieving the duties of the dispatch center.

Tree-trimming cycles were not on schedule, which provided more limbs and trees to collect ice and to interfere with electric lines. Trees off the trimmed right-of-way and trees along service lines contributed to the damage to electric facilities.

A productive means of communication for KCPL customers and other interested parties was the website. Information on the affected areas and the crews assigned were of interest to customers. The number of customers without power was aggregated together system-wide in the KCPL reports, but the geographic reference to the areas where crews were working and the crew assignment map were helpful.

Communication with city officials in the KCPL service territory and having a representative present at the Kansas City EOC reflected the pro-active approach expressed by KCPL. Because of city responsibilities to respond to police, fire and health emergencies, communication with the electric utility was important.

The 21st Century Interactive Voice Response system recognizes either the customer phone number or the account number. Links in the database to name and address would increase the opportunity to find a match and generate the work order automatically.

Recommendations

1. Maintain scheduled trim cycles for tree-trimming/vegetation management for both rural and urban areas to ensure safe and reliable service. Evaluate the results of these programs on a regular basis and make changes as necessary.

2. Contact city officials and agencies impacted by extended electric outages twice a year to update telephone and personnel changes.

3. Structure a curriculum that periodically informs and updates the medical-need customers and communicates the expectations of the program.

4. Pursue ways to provide positive feedback to customers that are routed to the Interactive Voice Response system for assurance that the reported outage has been received.

5. Enhance the Interactive Voice Response of 21st Century to provide more options for the computer database to match a customer and location to speed response during high volume periods.

6. Evaluate the costs, benefits and feasibility of enhancing the computer system in order to automate the workflow and work processes of its service orders.

Missouri Public Service

Restoration Plan

The Emergency Notification and Disaster Plan (Plan) of Missouri Public Service (MPS) – now known as Aquila - is the document used to provide guidelines for service restoration if widespread outages occur within its service area. At approximately 3:00 PM on January 30, 2002, management recognized the extent of the ice storm and the impact on its electric system and implemented the Plan. Assessment of the damage was initiated to determine the resources necessary to respond to the outages. Initial contacts with contract electrical companies and tree-trimming contractors relayed the need for additional crews and to reserve these resources for MPS. MPS also contacted utilities in other states in an effort to secure additional crews to assist in the restoration effort.

This storm was quickly classified as the highest-level storm, a Class III Disaster, and notification procedures were activated in accordance with the Plan. Initial response to the outages included the recall of normal utility crews to work to restore power. Damage assessment teams provided input to management on the extent of damages to electric facilities. The MPS service area encircles metropolitan Kansas City, Missouri and includes much of rural west-central Missouri. Appendix A shows the service territories of the regulated utilities of Missouri affected by this ice storm.

The Plan provides restoration priorities that direct attention to critical services and main distribution feeders first. See Appendix B for an illustration of the electric utility structure that delivers electricity from generating facilities to homes. Priority is given to public service agencies such as police, fire, water, sanitary, and hospitals. These critical agencies are identified by electric utilities in the normal course of business and are a priority for restoration. When main distribution feeders are restored to service, large numbers of customers are typically returned to service relatively quickly.

Employee and public safety is the first consideration of all restoration processes and is outlined in the Plan. Operational safety rules for employees are stressed to provide a safe working environment and to protect the public. The Plan calls for a work schedule that includes an eight (8) hour rest period. After the first night of the storm, and the recognition of the extent of the damage, crews were scheduled to work sixteen (16) hours daily, with eight (8) hours of rest. The damage incurred required the management of workers to sustain an ongoing effort for more than ten (10) days.

On Thursday morning, January 31, 2002, MPS reported that outages due to the storm affected approximately 53,800 electric customers. Appendix E-1 provides a summary of the daily estimates of customers without service by geographic service areas of MPS. Each day the number of customers without service was reduced, even though additional outages were discovered or

reported. As the work progressed, with large groups of customers restored when the main distribution circuits were energized, the restoration effort slowed as the work shifted over to service line repairs to homes.

Restoration Workforce

With the outages reported in the rural districts of the MPS service area on January 30th and the continuing buildup of ice in the Kansas City metro area, outside resources were sought. MPS was able to secure crews from St. Joseph Light & Power and WestPlains Energy, affiliates under Aquila. The St. Joseph area received substantial snow, but no ice. WestPlains Energy crews from Colorado arrived to help with restoration as well as crews from Illinois Power. Appendix E-2 contains a summary of the personnel working in each district from January 31st through February 10th.

As a matter of practice, the investor-owned utilities cooperate in an assistance program for emergencies such as this ice storm. MPS called companies in other states but was unable to secure additional crews, except for Illinois Power that sent crews after its Illinois customers were restored. Early in the storm, some utilities were waiting to see the impact of the ice on their own systems before releasing crews to assist in Missouri. A number of requests for additional crews from other utilities were unsuccessful due to KCPL having previously reserved their crews. Other states, including Texas, Oklahoma, Kansas, and Illinois, sustained damage from this ice storm and were soliciting outside help to restore their electric service.

MPS was successful in retaining a number of contract electrical crews to assist with restoration as well as additional tree-trimming crews. These crews came from a number of adjoining and distant states. The workforce increased significantly from Thursday through Saturday, February 2nd. Additional crews were available after February 6th, when crews were released by KCPL. As outside crews reported to MPS to help with the restoration they were assigned to a district. The districts coordinated their restoration efforts.

The restoration effort by MPS was more intensive than other utilities because MPS assumed responsibility for the meter base that is attached to the house. If necessary, MPS replaced or repaired the meter base to restore service. MPS construction standards require a new customer to install the meter base on the house and then MPS attaches the service conductors from the transformer to the meter. MPS assumes responsibility for repair of these facilities that are attached to their service line. See Appendix C for further explanation of service line responsibility.

Call Center

The two Call Centers for Aquila are located in Raytown, Missouri (84 representatives) and Lincoln, Nebraska (75 representatives) and together have

180 incoming lines. As calls are received by MPS, they are forwarded to the next available customer service representative at either location. All customer calls to report downed lines are directed to a representative. MPS reported that a customer call to the Call Center should not receive a busy signal. During periods of high call volume, a courtesy message explains that the Call Center is experiencing heavy call volume, that all lines are busy, and to please try again later.

A High Volume Call Activation System (HVCAS), provided through Twenty-First (21st) Century, was activated the first day of the storm, January 30th. If desired, customers are able to opt out of the HVCAS at any time to talk to a representative. Call Center representatives worked 10-hour shifts during the storm. MPS representatives were initially allowed to determine the amount of hours they desired to work, which in some cases was 16 hours. MPS found that the more tenured representatives felt comfortable working the more extended hours. MPS had forty-one (41) employees with Call Center experience volunteer to assist with call handling to augment the normal staff. Appendix E-3 tabulates the volume of calls received each day during the storm.

Service orders are automatically generated following calls handled by 21st Century. In contrast, representatives at the Call Center must manually enter the information following the calls when the representatives take information. The computer system generates a service order by matching the caller's home phone number with its database. It is through the customer's phone number that MPS is able to locate the premise where a serviceman is needed. If the computer system is unable to perform a match, a non-match report is created. Under normal circumstances, the representatives update and validate the customer's information, i.e., name on account, phone number, on all calls received.

An Interactive Voice Response (IVR) system has been in place for the Call Center since Fall 2001. The IVR is able to receive and handle "simple calls", i.e., name change on account and read in/read out of service. Customers are able to opt out of the IVR at any time, if they wish to talk to a representative.

In order to assist in representatives' responses to customer calls, information was provided throughout the storm. The Call Center supervisors were updated twice each day, 6:30 a.m. and 3:00 p.m., during the storm by the MPS Information Officer and this information, as well as MPS news releases, were forwarded to the representatives.

MPS medical-need customer accounts are noted as such. Throughout the storm, these customers were informed to take necessary precautions until their service could be restored. Under normal circumstances, these customers can be given special consideration in terms of electric service restoration, but the severity of this storm made individual restoration efforts impossible.

Calls received that the representative classified as threatening were forwarded to the MPS security department. Frustration and anger was expressed to the representatives and in some instances to the crews.

MPS provided automatic callbacks to approximately 10% of their customers that had contacted the Call Center and were matches to known customer phone numbers/accounts to ensure their service had been restored. Call backs to customers that were non-matches were performed by the MPS Dispatch Department.

Communications/Media

Public communication was initiated on January 30th by contact with the Public Service Commission Staff and contact with local news media concerning the impact of the ice storm. Beginning the morning of Thursday, January 31st, the communication staff of MPS distributed two news releases each day, at approximately 8:00 AM and 4:30 PM. The news releases were faxed to newspapers, radio stations, and television stations in the affected areas and the communications staff offered media coverage of the restoration work.

The MPS Community Relations staff contacted city officials in areas affected by the ice. MPS responded to numerous requests from city officials concerning specific areas and customers. Copies of the twice-daily news releases were faxed to the city halls of the affected communities.

As the outage time increased, MPS recognized that customers were looking to MPS's website for updates and information about the restoration effort. Initially, the website did not include storm information. On Wednesday, February 6th, updates were provided twice daily on the website concerning the recovery effort. The web page included summary numbers of customers still without service, safety information, and other information about the response to the storm.

Tree-Trimming

The devastation from the falling trees and limbs directs attention to the tree-trimming policies of the electric utilities. Tree limbs are typically trimmed along electric easements to the extent that limbs can be kept away from electric lines until the next cycle commences. In urban areas, it is generally anticipated that trees would be trimmed on a three-year cycle on the major feeders and five-years on single-phase laterals. In rural areas, the cycle may be longer because more clearance is attained between trimmings.

Expenditures on tree-trimming have increased over the last five years in the MPS service area. In the Kansas City metro area there were circuits recently trimmed as well as some circuits past the normal cycle period. The impact of the ice storm caused trees off the right-of-way to fall through the electric lines. Even

if properly trimmed, trees caused extensive damage to the electric facilities. Removal of over-hanging limbs improves the situation. Staff observed areas that were trimmed in 2001, which sustained considerable damage from the ice.

Conclusions

MPS recognized the severity of the ice storm and reacted quickly. Reservations of contract electric crews and tree-trimmers were successful, but electric crews from other electric utilities were already committed elsewhere when MPS was requesting additional crews. Despite this problem, the MPS workforce grew to 687.

MPS utilized the district offices to coordinate the restoration effort. This decentralization was necessary to manage the workforce in the MPS service area affected by the ice. Resources were allocated to each district as additional crews arrived, in response to the damage assessments. The districts organized the work to restore service. The diverse geographic areas of the MPS service area affected by the storm brought challenges. The rural areas served from the district offices in Belton, Warrensburg, Lexington and Clinton represent miles of overhead facilities that were impacted by the ice. Restoration was slow in these areas due to the severity of the storm, particularly through the Warrensburg area, and the miles of line exposed to the elements. Crews completing work in a district were directed to other districts in an effort to restore the greatest number of customers in the least time.

Interviews with city officials brought questions concerning the allocation of crews and communication with cities on the progress of restoration. Many electric customers called the cities in an effort to secure information on the estimate of the length of their outages and frustration with the outages that continued after a week. The information provided to the media and through the press releases were not meeting the needs of some customers or city officials. The district summaries of the customers without electric service prepared by MPS for the twice-daily press releases crossed city boundaries and were not useful for the individual cities in assessing the progress of work to restore service. Discussions with city officials and MPS provided insight into the needs and resources of the cities and the utility. Meetings between the cities and MPS since the ice storm have been helpful in understanding the needs and responsibilities of each party.

An area of concern in the restoration effort is the needs of customers with medical problems that rely on electric service. MPS keeps a list of customers that register their medical needs. Annual update of this list is sought by MPS to ensure an accurate list. These medical needs are used to prioritize routine work and to inform customers if electricity is interrupted for routine maintenance. In situations such as this ice storm, the utility is unable to respond to the individual needs of customers. Customers with medical needs are best served in these

instances by having timely information from the utility on the expected length of the outage so that other arrangements can be made.

The work done by MPS on the service entrance and meter base of customers added to the time required to complete the restoration of service.

Recommendations

1. Maintain scheduled trim cycles for tree-trimming/vegetation management for both rural and urban areas to ensure safe and reliable service. Evaluate the results of these programs on a regular basis and make changes as necessary.

2. Contact city officials and agencies impacted by extended electric outages twice a year to update telephone and personnel changes.

3. Structure a curriculum that periodically informs and updates the medical-need customers and communicates the expectations of the program.

4. Pursue ways to provide positive feedback to customers that are routed to the Interactive Voice Response system for assurance that the reported outage has been received.

5. Enhance the Interactive Voice Response of the Call Center to provide more options for the computer database to match a customer and location to speed response during high volume periods.

6. Evaluate the costs, benefits and feasibility of enhancing the computer system in order to automate the workflow and work processes of its service orders.

Restoration Plan

The AmerenUE Storm Restoration Guide (Guide) has been developed to communicate policy regarding the Emergency Operations Center (EOC) and to serve as a reference tool for managing restoration during major storms. The Guide includes checklists, procedures, and responsibilities for managing the restoration of electric service from damage caused by major storms. Storm levels defined in the Guide outline the response necessary to get customers back in service, based upon the number of customers affected and the extent of the damage. The ice storm of January 30, 2002 required the activation of the Emergency Operations Center as a Level III (Major) Storm.

The ice storm struck portions of the AmerenUE service territory in the Little Dixie and Green Hills Districts, affecting communities from Excelsior Springs just north of Kansas City, to Moberly in central Missouri to Canton on the Mississippi River. See Appendix A to view a map of the areas affected by the ice storm.

AmerenUE activated their storm plan at approximately 3:00 PM on January 30, 2002. Crews from other AmerenUE districts were dispatched to the affected areas. Appendix F outlines the number of customers that experienced outages each day until restoration was completed on February 2nd, and the number of additional workmen sent to assist the normal district crews.

Restoration Workforce

UE crews and contract crews already working within the Ameren service area were activated quickly to move from other districts of the company to assist in the restoration of service in affected areas. AmerenUE managed the restoration from its EOC in St. Louis by coordinating the callout of crews from other districts and providing necessary resources. Local managers directed the response in the field. The AmerenUE Outage Analysis System (OAS) provided the electronic capacity for the Storm Coordinator to manage the restoration. Input into the OAS includes information from the Call Center from customers and electronic information from the CellNet automatic meter reading (AMR) system. The OAS groups the information from the various sources and provides information to the service crews to speed the restoration of service. Orders were sent to the terminals in the service trucks where they were accepted by the servicemen and cleared when completed.

Call Center

Outage reports were taken by the UE call centers in St. Louis, Cape Girardeau, and Jefferson City, or by other contract resources utilized by UE. The Call Center representatives verify the caller's name and telephone number on every trouble call that is not handled by voice response to ensure an accurate database. The

representatives have access to all possible internal data screens, which provides them with an abundance of information. During storm situations, the computer system provides individual and summary information to respond to customer inquiries.

AmerenUE has contracts with two companies that assist with handling calls when the volume of calls to its Call Center is more than the representatives on duty can handle. These contracts are with First Contact and Twenty-First (21st) Century. First Contact provides a live operator for the caller and is a mirror image of the UE system, and information is entered into the system like normal operation at the Call Center. Another resource is 21st Century that gathers information electronically, but it does not provide a live operator. Approximately 98% of AmerenUE's customers have meters that report outages, and although not all outage reports are actually received from the meters, the ones that are received help supplement the data from actual customer calls. UE stated that its call back function to customers is assigned to its dispatchers and can be automatically completed.

UE employs seventeen (17) home agents. These home agents operate with the same equipment located in their homes as the representatives located at the Call Centers. The major benefit of employing home agents is that in addition to working their normal hours during their day shift, they are immediately available when called upon to work during storms that occur outside of the core hours. The home agents are AmerenUE's first line of defense when storms occur. As this storm began during the daytime, utilization of home agents was not a factor on the first day.

Unlike Kansas City Power & Light and Missouri Public Service, the AmerenUE call center was not impacted severely by this ice storm. The Call Center was able to answer and record the information from the customers in a timely manner. Appendix F contains a summary of the Call Center Activity during the five-day period, January 29 through February 2. The limited use of outside resources indicate the ability of the UE call centers and other systems to keep up with the inflow of customer calls during this service interruption due to the ice.

The priority provided for medical-need customers is primarily for planned outages. Currently, the Company has 3,100 medical-need customers; their accounts are coded to denote a medical-need. UE stated that a letter is mailed once a year to these customers to document whether or not the customer should remain on the medical-need list.

Communications/Media

Media communications were handled by district personnel in the local areas affected by the storm. The storm stretched across the UE service territory in the northern portions of Missouri from Excelsior Springs to Canton. Radio, television and newspapers were given updates of the restoration progress to provide information to the public. Local officials were contacted to share information on the progress of the restoration.

Tree-Trimming

Tree-trimming expenditures have increased over the last four years, including budget amounts for 2002, across the UE system. In the Green Hills District, as well as other Regional Districts of UE, the tree-trimming cycle is longer than the urban areas. Some areas of the Little Dixie District had recently been trimmed, which helped to minimize the damage in those areas. The accumulation of ice from this storm pulled down trees and limbs into many electric facilities. As with the other utilities affected by the storm, the most destruction was on service lines to homes. These lines to individual homes are not on a dedicated easement and are not trimmed by the utility. Trimming the service lines is the responsibility of the property owner.

Conclusions

UE was able to respond quickly to the ice storm, muster internal crews and resources to restore service to its customers. In response to the outages in portions of the Green Hills District, UE moved in a timely manner and restored service quickly. UE crews were utilized by KCPL after the UE customers were restored. This provided a valuable resource to the customers of KCPL in restoration of service.

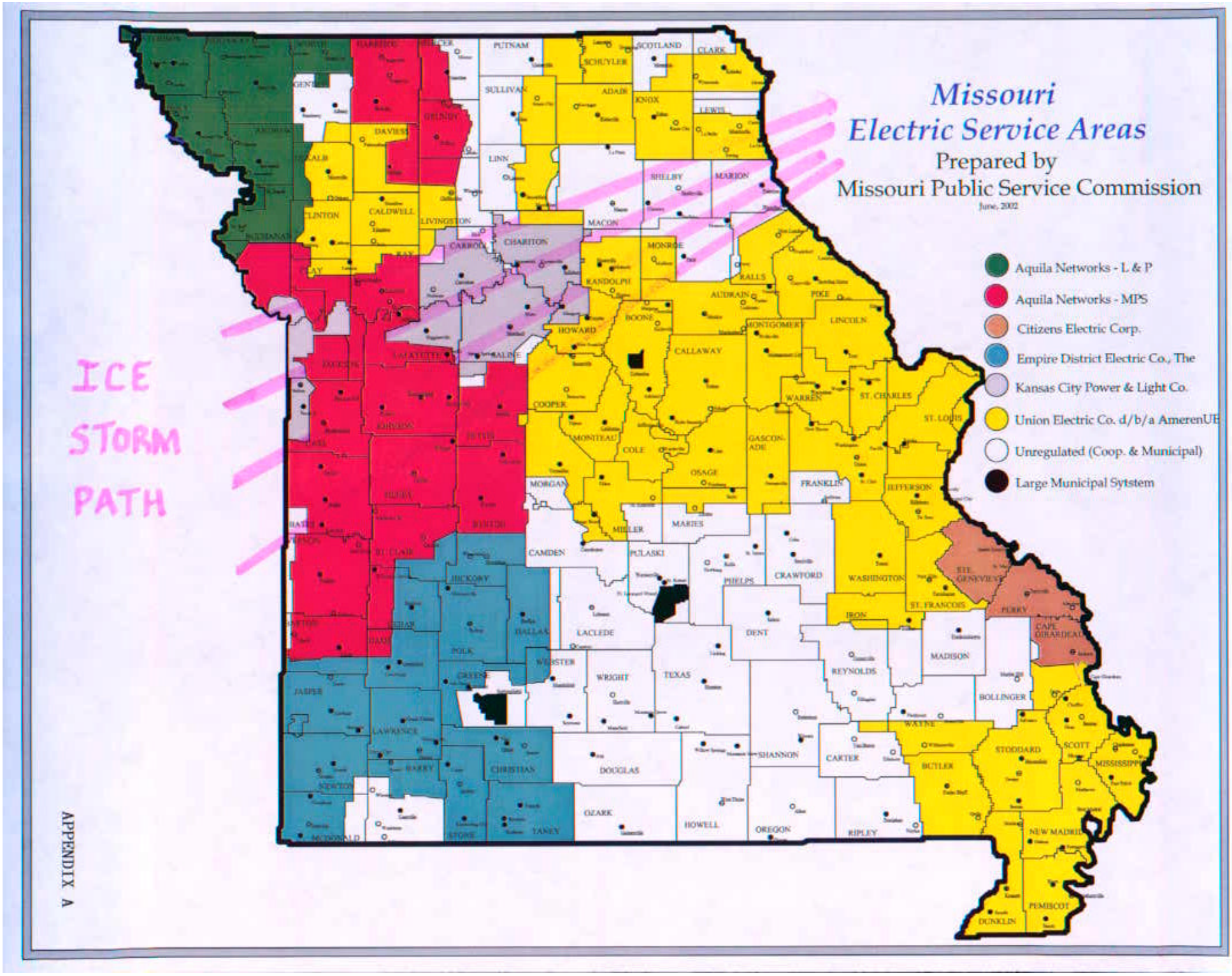
Recommendations

1. Maintain scheduled trim cycles for tree-trimming/vegetation management for both rural and urban areas to ensure safe and reliable service. Evaluate the results of these programs on a regular basis and make changes as necessary.

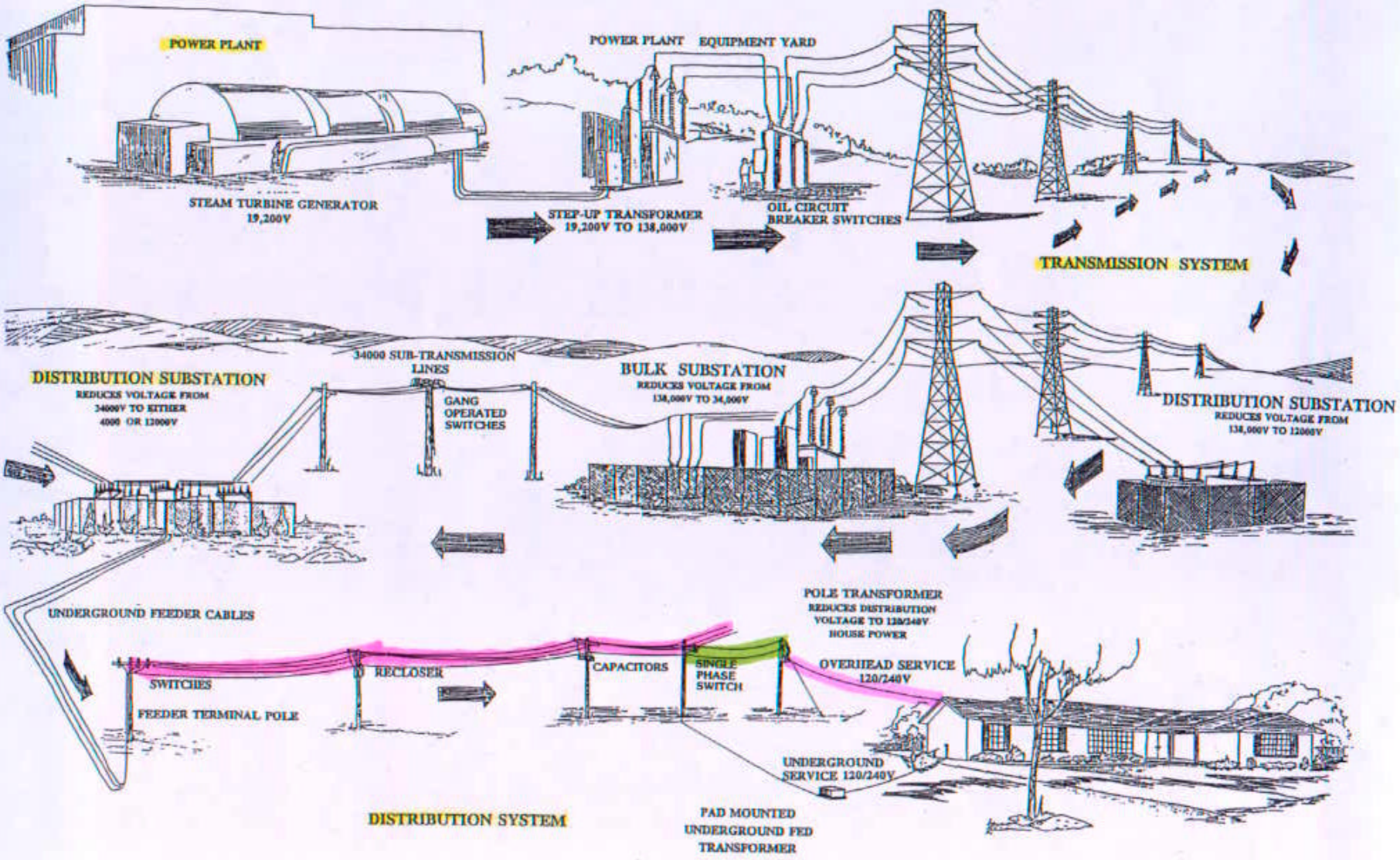
2. Contact city officials and agencies impacted by extended electric outages twice a year to update telephone and personnel changes.

3. Structure a curriculum that periodically informs and updates the medical-need customers and communicates the expectations of the program.

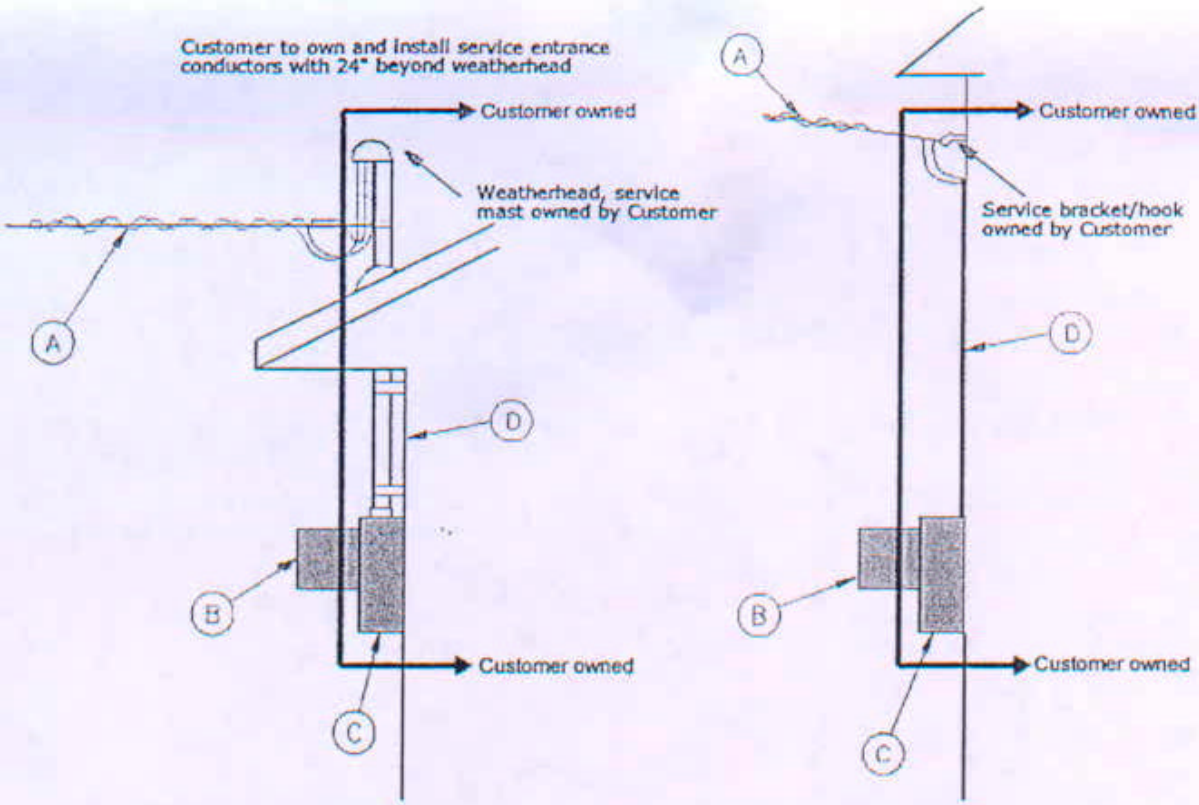
4. Pursue ways to provide positive feedback to customers that are routed to the Interactive Voice Response system for assurance that the reported outage has been received.


Missouri
Electric Service Areas
Prepared by
Missouri Public Service Commission
June, 2002
Aquila Networks - L & P
Aquila Networks - MPS
Citizens Electric Corp.
Empire District Electric Co., The
Kansas City Power & Light Co.
Union Electric Co. d/b/a AmerenUE
Unregulated (Coop. & Municipal)
Large Municipal Sytstem
ICE
STORM
PATH
PUTNAM
SCHUYLER
SCOTLAND
CLARK
SULLIVAN
ADAIR
KNOX
LEWIS
DAVIESS
GRUNDY
LINN
SHELBY
MARION
CALDWELL
LIVINGSTON
MACON
CARROLL
CHARITON
MONROE
RANDOLPH
RALLS
PIKE
AUDRAIN
BOONE
MONTGOMERY
LINCOLN
HOWARD
CALLAWAY
WARREN
ST. CHARLES
ST. LOUIS
COOPER
MONITEAU
COLE
GASCONADE
OSAGE
FRANKLIN
JEFFERSON
MORGAN
MILLER
MARIES
CAMDEN
PULASKI
PHELPS
CRAWFORD
WASHINGTON
STE. GENEVIEVE
ST. FRANCOIS
PERRY
IRON
CAPE GIRARDEAU
LACLEDE
DENT
MADISON
WRIGHT
TEXAS
REYNOLDS
BOLLINGER
WAYNE
DOUGLAS
SHANNON
CARTER
STODDARD
SCOTT
BUTLER
MISSISSIPPI
OZARK
HOWELL
OREGON
RIPLEY
NEW MADRID
PEMISCOT
DUNKLIN
APPENDIX A

UNION ELECTRIC COMPANY
GENERATING AND POWER
DISTRIBUTION SYSTEM



APPENDIX B



A Service conductors and connections owned by KCP&L
B Meter owned by KCP&L
C Meter Can owned by Customer
D Service entrance conductors owned by Customer

Drawing above illustrates service line and meter base responsibilities for KCPL customers. UE customers have the same responsibilities.

New MPS customers are responsible for providing and installing the meter base and point of connection on the house, i.e., weather head or service bracket. After the service is connected, MPS assumes responsibility for the facilities connected to the house and damage from the ice storm was repaired by MPS crews. Internal wiring is the customer's responsibility.

CUSTOMER OUTAGES - KCPL

Date	31-Jan-02 Thursday	1-Feb-02 Friday	2-Feb-02 Saturday	3-Feb-02 Sunday	4-Feb-02 Monday	5-Feb-02 Tuesday	6-Feb-02 Wednesday	7-Feb-02 Thursday	8-Feb-02 Friday	9-Feb-02 Saturday
Customer Outages	305,000	185,000	102,000	70,000	52,000	40,000	27,000	15,000	4,500	500
Circuits Locked Out (1)	150	67	16							

There are 474,000 KCPL customers in Kansas and Missouri

(1) Circuits locked out is the number of three-phase circuits (also called distribution feeders) whose substation breakers were open - locked out of service - because of electrical faults on the circuit. All customes on these circuits are without service until the faults are cleared and the circuit is re-energized. See illustration on Appendix B. Many customers may not have had problems on their portion of the circuit or with the service wires serving their home and are restored when these circuits were re-energized. This is evident as the number of customers without service is greatly reduced as the number of circuits locked out is reduced.

RESTORATION WORKFORCE - KCPL

	Northland	JoCo	F&M	Dodson	South District	East District	Operations	Crews	People
OUTSIDE UTILITY ASSISTANCE									
Ameren		66						66	149
Ameren (CIPS)		4	8					12	41
Ameren							28	28	58
OPPD		6						6	19
OPPD (2/6)		5						5	18
Excel-Minneapolis	11	30	18					59	106
Com Ed	16							16	41
Excel-Denver		8						8	39
Reliant				17				17	94
Cinergy			18					18	63
Southern Indiana	2							2	10
Mid American Energy				15				15	55
Mid American Energy (2/6)								8	30
Empire District				9				9	21
Entergy - Arkansas				28				28	127
Entergy - Miss.					19			19	97
Indianapolis P&L		6						6	25
UTILITY SUBTOTAL	29	125	44	69	19	0	28	322	993
OUTSIDE CONTRACTOR ASSISTANCE									
LE Myers				11				11	24
LE Myers (2/6)		6						6	28
Par: Dillard & Smith									
D&S - Chattanooga, Tennessee		7						7	42
D&S - Memphis, Tennessee			3					3	17
New Market, Tennessee		22						22	126
D&S - College Park, Georgia		3						3	17
North Houston Pole Line		6						6	28
Hooper		10						10	54
NG Gilbert				10				10	42
Henkels & McCoy				11				11	35
Henkels & McCoy (from UE)					9	7		16	60
Henkels & McCoy (from UE)							2	2	6
Sachs			4					4	17
JF Electric				10				10	30
Asplundh (electric)			4					4	16
SUBTOTAL	0	54	11	42	9	7	2	125	542
OUTSIDE TREE CREW ASSISTANCE									
Nelson (tree crews)								31	62
Asplundh (tree crews)								283	866
TOTALS								314	928
LOCAL ASSISTANCE									
Capital							8	4	8
CLS								3	9
Par								17	65
Asplundh (tree crews)								50	145
KCPL (crews)								44	300
TOTALS								118	527
GRAND TOTALS								879	2990

CALL CENTER SUMMARY- KCPL

DATE	TOTAL CALLS	CALL CENTER	BRITE IVR	21st CENTURY	SERP CALLS
30-Jan-02 Wednesday	63,047	5,725	5,782	49,927	1,613
31-Jan-02 Thursday	76,612	7,815	8,203	55,633	4,961
1-Feb-02 Friday	38,691	6,122	5,711	22,346	4,512
2-Feb-02 Saturday	29,581	4,401	4,650	16,788	3,742
3-Feb-02 Sunday	23,458	3,800	3,756	13,210	2,692
4-Feb-02 Monday	29,445	5,808	3,896	12,696	7,045
5-Feb-02 Tuesday	21,275	4,994	3,458	8,213	4,610
6-Feb-02 Wednesday	15,704	4,042	2,791	5,114	3,757
7-Feb-02 Thursday	11,665	3,375	1,867	4,487	1,936
8-Feb-02 Friday	8,243	2,924	1,444	3,001	874
9-Feb-02 Saturday	3,599	990	757	1,496	356
10-Feb-02 Sunday	2,206	488	517	1,063	138
Totals	**323,526**	**50,484**	**42,832**	**193,974**	**36,236**

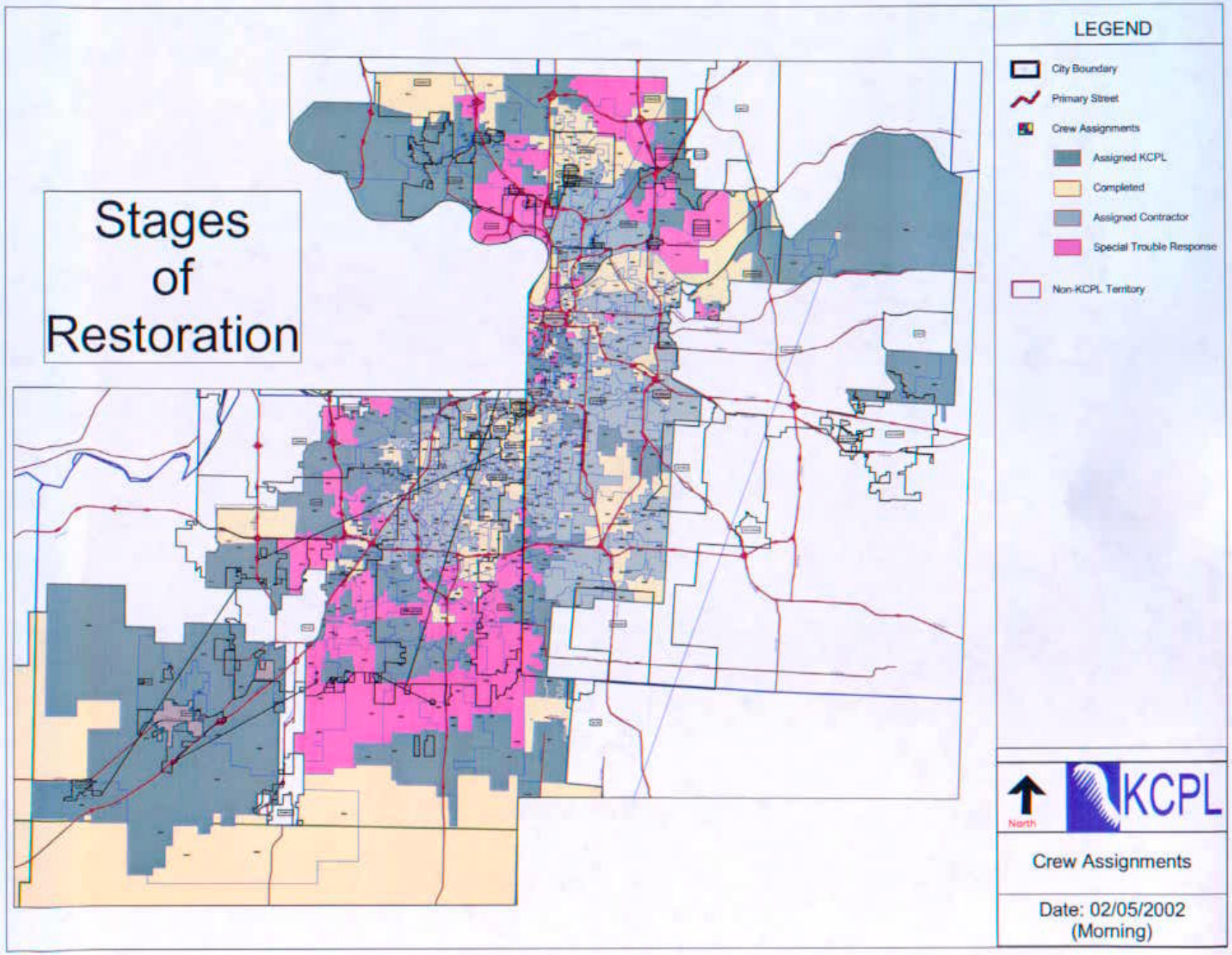
Brite IVR - Interactive Voice Response that is an automated call feature within the KCPL telephone system

Call Center - KCPL Customer Communication Center (CCC) answered outage reports received from 471-KCPL calls, calls not answered, rolled to Brite IVR

Twenty-First Century - Automated response to customer inquiries from 888-LIGHTKC

SERP personnel initiated calls to customers to verify that service was restored and to identify areas that were still without service. Volunteers activated through the SERP completed 80% of the callbacks.

	First week		Second Week		Overall	
	Calls	Percentage	Calls	Percentage	Calls	Percentage
21st Century	178,813	63.38%	15,161	36.61%	193,974	59.96%
Brite IVR	35,456	12.57%	7,376	17.81%	42,832	13.24%
CCC Representatives	38,665	13.71%	11,819	28.54%	50,484	15.60%
SERP Calls	29,175	10.34%	7,061	17.05%	36,236	11.20%
TOTALS	**282,109**		**41,417**		**323,526**	


Stages of Restoration
LEGEND
City Boundary
Primary Street
Crew Assignments
Assigned KCPL
Completed
Assigned Contractor
Special Trouble Response
Non-KCPL Territory
North
KCPL
Crew Assignments
Date: 02/05/2002
(Morning)

MPS Customer Outages

Daily customer outages as reported at 8:00 AM

Areas Served / Date	31-Jan-02	1-Feb-02	2-Feb-02	3-Feb-02	4-Feb-02	5-Feb-02	6-Feb-02	7-Feb-02	8-Feb-02	9-Feb-02	10-Feb-02
	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Lee's Summit/Raytown/ Pleasant Hill	20000	10000	5500	5000	3000	2600	2450	2200	1400	465	180
Blue Springs/Grain Valley/Oak Grove	10800	5800	5000	3200	2500	2150	1800	1432	800	20	
Belton/Grandview/Raymore	8400	6900	5400	4064	2130	1200	900	800	600	490	200
Warrensburg/ Sedalia	4500	7300	3900	2175	1520	1115	835	533	397	115	30
Lexington/Henrietta	2500	3000	2900	2117	1250	800	700	450	380	70	30
Liberty/Platte City	6000	2600	1400	700	450	200	50				
Clinton/Nevada	1600	1800	565	150	15						
TOTAL	**53800**	**37400**	**24665**	**17406**	**10865**	**8065**	**6735**	**5415**	**3577**	**1160**	**440**

(MPS customers: 205,000)

MPS - Restoration Workforce (at 6:30 AM daily)

Personnel / Date	31-Jan-02 Thursday	1-Feb-02 Friday	2-Feb-02 Saturday	3-Feb-02 Sunday	4-Feb-02 Monday	5-Feb-02 Tuesday	6-Feb-02 Wednesday	7-Feb-02 Thursday	8-Feb-02 Friday	9-Feb-02 Saturday	10-Feb-02 Sunday
MPS	90	99	121	128	132	131	133	133	138	130	128
SJLP	25	25	25	25	25	25	25	23	23	23	24
WPE	18	18	18	18	18	18	18	18	19	18	18
Tree-trimmers	117	114	230	216	222	213	206	208	177	133	129
Par	68	92	108	131	129	129	129	143	141	145	156
Capital	8	11	17	21	22	22	22	21	22	22	23
LEMCO		7	29	28	28	28	28	28	38	54	43
Illinois Power								34	34	34	34
Field scouts/escorts	58	60	59	67	60	62	60	63	66	54	52
Schultz Electric									22	24	24
Tiede Line Construction											18
Waffensmith											38
Totals	**384**	**426**	**607**	**634**	**636**	**628**	**621**	**671**	**680**	**637**	**687**
Distribution of Workers											
Lee'sSummit/Raytown/PleasantHill	84	91	126	143	141	145	145	187	217	215	301
BlueSprgs/GrainValley/OakGrove	69	72	101	105	102	103	102	124	124	94	55
Belton/Grandview/Raymore	59	65	110	120	119	115	107	128	128	149	226
Warrensburg/ Sedalia	100	99	131	156	167	173	174	160	150	120	53
Lexington/Henrietta	25	29	58	62	60	60	60	54	46	45	39
Liberty/Platte City	31	30	43	31	31	23	22	11	11	10	9
Clinton/Nevada	16	40	38	17	16	9	11	7	4	4	4

CALL CENTER SUMMARY - MPS

	Calls Received	Calls Answered	Calls handled by 21st Century
Jan. 30	21,779	16,695	53,481
Jan. 31	21,795	17,304	38,227
Feb. 1	14,928	13,417	19,059
Feb. 2	6,662	6,098	10,107
Feb. 3	5,474	4,153	6,840
Feb. 4	15,993	14,116	7,795
Feb. 5	11,142	10,899	5,068
Feb. 6	9,352	9,239	3,252
Feb. 7	9,397	9,233	2,760
Feb. 8	8,945	8,877	3,175
Feb. 9	3,845	3,491	1,989
Feb. 10	2,215	2,166	1,603
Feb. 11	10,490	10,433	888
Totals	142,017	126,121	154,244

CUSTOMER OUTAGES - AmerenUE

	30-Jan-02	31-Jan-02	1-Feb-02	2-Feb-02
	Wednesday	Thursday	Friday	Saturday
Customers Out / Restored as of midnight each day	**13650** / 18656	**6029** / 40433	**443** / 51289	**17** / 52611

RESTORATION WORKFORCE - AmerenUE

Date	30-Jan-02 Wednesday	31-Jan-02 Thursday	1-Feb-02 Friday	2-Feb-02 Saturday
Additional UE Personnel	30	265	329	Crews released to KCPL

Numbers do not include local workforce in affected districts.
Numbers include 48 contract linemen from Henkels/McCoy that were working for UE.
UE sent crews from other Ameren districts not affected by the ice storm to assist with restoration.

CALL CENTER ACTIVITY - AmerenUE

DATE	TOTAL CALLS AMEREN	TROUBLE CALLS	FIRST CONTACT	VOICE RESPONSE	HIGH VOLUME 21st CENTURY
30-Jan-02 Wednesday	12,793	6,102	172	2255	32
31-Jan-02 Thursday	12,576	6,432	110	2750	none
1-Feb-02 Friday	8,250	2,741	101	914	none
2-Feb-02 Saturday	1,992	655	30	98	none

First Contact - outside contractor that provides operator to take information from caller.
Voice Response - callers to UE Call Center input information to an automated system that generates a work order.
21st Century - outside contractor that provides automated response to call that generates a work order.

APPENDIX F

Appendix G

Pictures

Ice Storm Pictures


STOP
2 2 '02


2 2 '02


2 2 '02


2 2 '02


2 2 '02


2 2 '02